

Claims

- [c1] 1.A method of maintaining a reducing atmosphere around an anode of a molten carbonate or solid oxide fuel cell, said method comprising the steps of:
- (a) monitoring the electrical potential generated by the fuel cell; and
 - (b) applying an external electrical potential across the fuel cell, such that electric current flows through the cell in a direction opposite to current flow during normal operation of the fuel cell, whenever the voltage output of the cell drops below a predetermined level.
- [c2] 2.The method of claim 1 wherein the fuel cell generated electrical potential is monitored by a controller comprising a voltmeter which is operatively connected to a switch and an electric power source for providing the external electrical potential to be applied across the cell.
- [c3] 3.The method of claim 1 wherein the source of the external electrical potential comprises a battery, a fuel cell, a generator, a turbomachine or an electrical mains connection.
- [c4] 4.The method of claim 2 wherein the controller maintains the electrical potential supplied to the cell at a predetermined level and the amount of current supplied to the cell is allowed to vary.
- [c5] 5.The method of claim 1 further comprising the step of monitoring pressure in an incoming fuel line and applying an external electrical potential across the fuel cell, such that electric current flows in through the cell in a direction opposite to current flow during normal operation of the fuel cell, whenever the fuel pressure drops below a predetermined level.
- [c6] 6.The method of claim 2 wherein the fuel cell is connected to an external load and further comprising the step of reducing or eliminating the external load prior to switching to the external power source.
- [c7] 7.A molten carbonate or solid oxide fuel cell comprising:
- (a) means for monitoring the electrical potential generated by the cell;
 - (b) an electric power source; and
 - (c) means for applying the power source to the cell whenever the electrical

potential generated by the cell drops below a predetermined level, such that electric current flows through the cell in a direction opposite to current flow during normal operation of the fuel cell, said power application means operatively connected to the monitoring means.

[c8] 8.The fuel cell of claim 7 wherein the monitoring means comprises a voltmeter and the power application means comprises a disconnect box for switching the cell output power and switching the electric power source.

[c9] 9.The fuel cell of claim 8 further comprising a controller which incorporates the monitoring means and which controls the disconnect box.

[c10] 10.The fuel cell of claim 7 further comprising means for monitoring pressure in an incoming fuel line, operatively connected to the means for applying a power source, wherein said pressure monitoring means activates the power application means when the pressure in the fuel line drops below a predetermined level.

[c11] 11.The fuel cell of claim 7 wherein the electric power source comprises a galvanic cell.

[c12] 12.The fuel cell of claim 11 wherein the galvanic cell is a battery.

[c13] 13.The fuel cell of claim 12 wherein the galvanic cell is another fuel cell.

[c14] 14.The fuel cell of claim 8 wherein said disconnect box comprises means for reducing or eliminating external load on the fuel cell in response to the controller.

[c15] 15.The fuel cell of claim 7 wherein the means for applying the power source is a switch which is responsive to the level of the electrical potential generated by the cell, as measured by the monitoring means.

[c16] 16.A molten carbonate or solid oxide fuel cell comprising:
(a)a controller comprising a voltmeter for monitoring the voltage output of the fuel cell;
(b)an external electric power source which, when applied to the fuel cell, causes current to flow through the fuel in a direction opposite to normal direction of

current during normal operation of the fuel cell;

(c) a disconnect box comprising a first switch for disconnecting the fuel cell from its external circuit and a second switch for applying the external power source to the fuel cell;

(d) wherein said controller is operatively connected to the disconnect box to disconnect the first switch and/or apply the second switch whenever the voltage output of the fuel cell drops below a predetermined level.

[c17]

17. The fuel cell of claim 16 further comprising a pressure gauge connected to a fuel input line and operatively connected to the controller, such that the disconnect box is activated when fuel pressure drops below a predetermined level.

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